

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) A lithographic projection apparatus comprising:  
a radiation system to supply a projection beam of radiation;  
a support structure adapted to support patterning structure which can be used to pattern the projection beam according to a desired pattern;  
a substrate table to hold a substrate;  
a projection system to project the patterned beam onto a target portion of the substrate;  
a gas supply, configured and arranged to supply a gaseous hydrocarbon to a space containing a mirror;  
at least one sensor selected from the group comprising a reflectivity sensor to monitor a reflectivity of said mirror and a pressure sensor to monitor a background pressure in said space;  
and  
a gas supply control to control said gas supply to control, responsive to a signal from said at least one sensor, a thickness of a layer of hydrocarbon formed on the mirror using the gaseous hydrocarbon.
2. (Original) An apparatus according to claim 1, wherein the radiation system contains said space containing the mirror.
3. (Previously Presented) An apparatus according to claim 1, wherein the radiation system comprises a laser-produced plasma source or a discharge source adapted to supply a beam of extreme ultraviolet (EUV) radiation as said projection beam.
4. (Original) An apparatus according to claim 3, wherein said beam of extreme ultraviolet radiation has a wavelength of less than about 50nm.
5. (Original) An apparatus according to claim 4, wherein said beam of extreme ultraviolet radiation has a wavelength in the range of from 8 to 20nm
6. (Original) An apparatus according to claim 5 wherein said range is from 9 to 16 nm.

7. (Original) An apparatus according to claim 1, wherein the hydrocarbon is an alcohol.
8. (Original) An apparatus according to claim 7, wherein the alcohol is ethanol.
9. (Original) An apparatus according to claim 1 wherein the mirror is a collector mirror.
10. (Previously Presented) A method of manufacturing a device using a lithographic projection apparatus comprising:
  - projecting a patterned beam of radiation onto a target portion of a layer of radiation-sensitive material on a substrate;
  - supplying a gaseous hydrocarbon to a space within the lithographic projection apparatus containing a mirror;
  - monitoring at least one of a reflectivity of said mirror and a background pressure in said space; and
  - controlling an amount of gaseous hydrocarbon supplied to said space to control, in response to the monitoring, a thickness of a hydrocarbon layer formed on the mirror using the gaseous hydrocarbon.
11. (Original) A method according to claim 10, wherein the hydrocarbon is an alcohol.
12. (Original) A method according to claim 11, wherein the alcohol is ethanol.
13. (Previously Presented) A method according to claim 10, wherein said mirror comprises at least 40 multilayers and wherein the method further comprises adapting the amount of gaseous hydrocarbon supplied to the space such that at least part of at least a top layer of said mirror undergoes sputtering.
14. (Cancelled)
15. (Currently Amended) A method of manufacturing a device using a lithographic projection apparatus comprising:
  - projecting a patterned beam of radiation onto a target portion of a layer of radiation-sensitive material on a substrate; and

supplying a gaseous alcohol to a space in a radiation system of the lithographic projection apparatus, which space contains a mirror,

wherein the alcohol forms a cap layer on said mirror, wherein, during the projecting, particles impinge the cap layer from a source other than the cap layer and the mirror and cause particles of the cap layer to be dislodged from the cap layer by sputtering~~causes sputtering of the cap layer~~, and wherein the gaseous alcohol is supplied to said space at a pressure sufficient to achieve a thickness of said cap layer which does not increase substantially over time.

16. (Previously Presented) A method according to claim 15, wherein the alcohol is ethanol.

17. (Cancelled)

18. (Previously Presented) The apparatus of claim 1, wherein the gas supply control is configured to, responsive to the signal, maintain the thickness of the layer substantially constant during supply of the projection beam of radiation.

19. (Previously Presented) The method of claim 10, comprising, responsive to the signal, maintaining the thickness of the layer substantially constant during supply of the projection beam of radiation.

20. (Currently Amended) A lithographic projection apparatus comprising:

a support structure adapted to support patterning structure which can be used to pattern a beam of radiation according to a desired pattern;

a substrate table to hold a substrate;

a projection system to project the patterned beam onto a target portion of the substrate;

a gas supply configured to supply a gaseous hydrocarbon to a space containing a mirror;

and

a gas supply control configured to control supply of the gaseous hydrocarbon to the space to maintain a layer formed on the mirror using the gaseous hydrocarbon at a substantially constant thickness in response to, ~~at least sputtering caused during supply of the projection beam,~~ particles of the cap layer being dislodged from the cap layer by sputtering caused by particles impinging the cap layer from a source other than the cap layer and the mirror.

21. (Previously Presented) The apparatus of claim 20, wherein the hydrocarbon comprises alcohol.
22. (Previously Presented) The apparatus of claim 20, further comprising a reflectivity sensor configured to monitor a reflectivity of the mirror, a pressure sensor configured to monitor a background pressure in the space, or both, and wherein the gas supply control is configured to, responsive to a signal from the at least one sensor, control the supply of the gaseous hydrocarbon to the space.
23. (Previously Presented) The apparatus of claim 1, wherein, in use, the layer of hydrocarbon is formed on the mirror by adsorption of the gaseous hydrocarbon.
24. (Previously Presented) The method of claim 10 comprising forming the layer of hydrocarbon on the mirror by adsorption of the gaseous hydrocarbon.
25. (Previously Presented) The method of claim 15 comprising forming the cap layer on the mirror by adsorption of the gaseous alcohol.
26. (Previously Presented) The apparatus of claim 20, wherein, in use, the layer formed on the mirror is maintained by adsorption of the gaseous hydrocarbon.